SPRT ®

SP－POS58
Line Thermal Printer

User's Manual

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Introduction

SP- POS58 printer is a new type line thermal printer, it features in fast speed print, low print noise, high reliability, perfect print quality and ribbon needless avoiding the vexation of regular maintenance.

SP-POS58 printer: small in outline dimension, simple operation, and extensive application, especially suitable for commercial cash register, PC-POS, bank POS and all kinds of receipts print.

Chapter 1 Feature and Performance

1.1 Print Performance

- Print method: direct thermal
- Print paper width: 57.5±0.5mm
- Print density: 8 dots/mm, 384 dots/line
- Print speed: approx. 70mm / sec. or 20 lines/sec.
- Reliability:
  Print head life: 50km
  MCBF: 5 million lines
  Using condition:
  * Print 12 × 24 ASCII characters, print 50 lines each time, intermittent print repeatedly
  * Each dot-line printing at the same time should not exceed 25%, each character-line and one dot vertically printing repeatedly should not exceed 11 times
  * Use specified thermal paper
- Valid print width: 48mm
- Feeding speed: approx.70mm / sec. or 20 lines / sec.

1.2 Print Paper

● Thermal paper model: TF50KS－E（Japan paper co.ltd）
AF50KS-E(JUJO THERMAL)

● Thermal paper: Width－－－－－－－－－ 57.5±0.5mm
Outer Diameter －－－ 80mm（max.）
Inner Diameter －－－ 13mm（min.）
Thickness －－－－－－ 53～60g / m^2

1.3 Print Font

- IBM Character set II (ANK):
  12×24 dots，1.25（W）×3.00（H）mm;
- GB GB2312-80(Chinese):
  24×24 dots，3.00（W）×3.00（H）mm.

1.4 Interface

● Parallel interface (SP-POS58P):
DB25 socket (male), 8-bit parallel interface, supports BUSY/ACK handshaking protocol, TTL signal level.

● Serial interface (SP-POS58S):
DB25 socket (female), supports RTS/CTS protocol, baud rate: 9600bps. Data structure: one start bit + eight data bits + one or over one stop bit(s), no parity.
● Cash drawer control
DC12V，1A，6-pin RJ-11 socket.

1.5 Print Control Command

● Character print command: supports double width and double height print of ANK characters, user-defined characters and Chinese characters, the character line spacing is adjustable.
● Graphics print command: supports the print of bit map graphics and download bit map graphics with different density
● GS bar code print command: supports EAN-13，EAN-8 bar code print.

1.6 Power Supply

● DC12V，3.3A

1.7 Operation Environment

● Operation temperature: 5～40℃
Relative humidity: 10～80％
● Operation environment temperature: 5～40℃
Relative humidity: 10～80％
● Storage temperature: -20～60℃
Relative humidity: 10～90%

1.8 Model classification

● SP-POS58P parallel interface
● SP-POS58S serial interface

1.9 Weight

● 1kg (excluding paper roll)

1.10 Outline Dimension

● 112（W）×200（L）×126（H）mm

Chapter 2 Installation and Operation

2.1 Printer Appearance

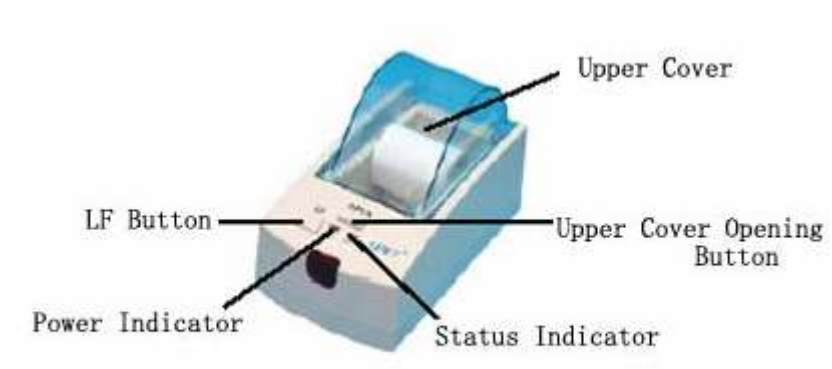


Fig. 2.1 Printer Appearance

2.2 Paper Installation

SP-POS58 adopts 57.5±0.5mm width thermal paper.
The steps of thermal paper installation are as the following:
Hold down the upper cover button, open the movable upper cover, move away the old paper roll, and put the new thermal paper in the paper holder of printer, draw a certain length of the paper roll, put the paper end on the print head, close the upper cover and press it downwards lightly until it restore to original position, and the paper end appears from the paper-out slot which is on the upper cover, then print paper installation is finished.

Caution!

1. When there is no paper in the print head, please don't press 【LF】 button, avoiding to influence the print head life;
2. Please don't draw the paper forwards or backwards with hands, When returning paper, please cut the extra paper, and press 【LF】 button, paper will go forwards.

2.3 Interface Connection

2.3.1 Parallel Interface Connection

The parallel interface of SP-POS58P printer is compatible with CENTRONICS, supports BUSY and /ACK handshaking protocol, it uses

DB25 socket (male), the pin order of parallel port is as Fig. 2-2 shows:

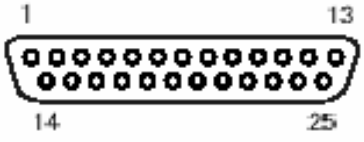


Fig.2-2 Pin Order of Parallel Port

The pin assignment of parallel interface is shown in Fig. 2-3 shows:

Pin No.	Signal	Direction	Description
1	/STB	In	Strobe pulse to latch data, reading occurs at falling edge.
2 3 4 5 6 7 8 9	DATA1 DATA2 DATA3 DATA4 DATA5 DATA6 DATA7 DATA8	In In In In In In In In	These signals represent the 1st bit to 8th bit of the parallel interface data, each signal is at HIGHT level when data is logic 1, and LOW when data is logic 0.
10	/ACK	Out	Answer pulse, LOW level signal indicates that data have already been received and the printer gets ready to receive the next data.
11	BUSY	Out	HIGH level signal indicates that the printer is BUSY and can not receive data.
12	PE	Out	HIGH level signal indicates that paper is end.
13	SEL	Out	Pulling up to HIGH level signal by a resistor indicates the printer is online.
15	/ERR	Out	Pulling up to HIGH level signal by a resistor indicates there is no error.

14,16,17	NC	---	No connection
18-25	GND	---	Grounding logical 0 level

Note: （1）“In” denotes inputting to the printer，“Out” denotes outputting from the printer.

（2）Signal level is TTL standard.

Fig.2-3 Pin Assignment of Parallel Interface

The timing chart for interface signal of parallel interface is as Fig.2-4 shows:

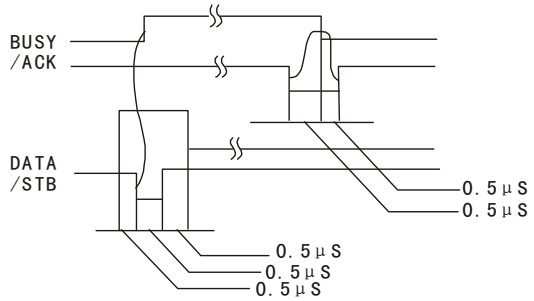


Fig.2-4 Signal Timing Chart of Parallel Interface

2.3.2 Serial Interface Connection

The serial interface of SP-POS58S printer is compatible with RS232C standard, supports RTS/CTS handshaking protocol, it uses DB25 socket (female), the pin order of the serial port is as Fig.2-5 shows:

Fig.2-5 Pin Order of the Serial Port

The pin assignment of serial interface is shown in Fig. 2-6:

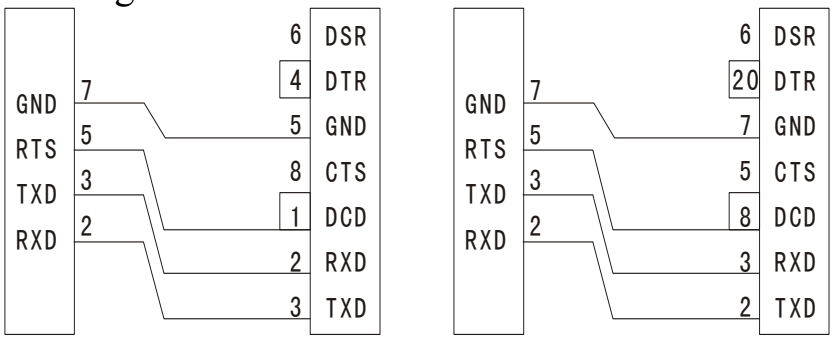
Pin No.	Signal	Source	Description
2	RXD	Host	Printer receives data from host
3	TXD	Printer	Printer transmits data to host

5	RTS	Printer	Signal “MARK” indicates that the printer is “BUSY” and unable to receive data; “SPACE” indicates that the printer is “READY” for receiving data.
7	GND	—	Signal Ground

Note: ①“Source” denotes the source that signal comes from;
② Logical signal level is EIA.

Fig.2-6 Pin Assignment of Serial Interface

The baud rate and data structure in serial interface mode are set to 9600bps, 8 data bits, no parity bit and 1 or over 1 stop bit(s).
The serial interface of SP-POS58 can be connected to standard RS-232C interface. When connected to IBM PC or compatible machine, connection can accord to Fig.2-7.



Printer 25pin Socket — IBM PC Serial Interface DB-9 | Printer 25pin Socket — IBM PC Serial Interface DB-25

Fig.2-7 Connection between SP-POS58S and IBM PC Serial Interface Sketch Map

2.3.3 Cash Drawer Interface

The cash drawer interface of SP-POS58 adopts RJ-11 6-pin socket, as Fig.2-8 shows:

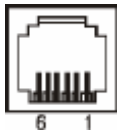


Fig. 2-8
Cash Drawer Interface

The pin assignment of the cash drawer interface is as follows:

Pin No.	Signal	Direction
1	Chassis Ground	---
2	Cash drawer driver signal	Out
3	Cash drawer on/off status signal	In
4	+12V DC	Out
5	N.C	---
6	Cash drawer on/off status signal ground	---

2.3.4 Power Connection

SP-POS58 uses external power supply as 9/12VDC±10％, 3.5A, power socket is A-1009-3P model, as Fig. 2-9 shows:

Fig.2-9 Power Socket

The pin assignment of the power supply connection is as follows:

Pin No.	Definition
1	+9/12VDC
2	GND
3	N.C.

Recommend using the power supply that offered by the printer producer, you can plug the power cable into the printer's power socket, if use other power supply, it should meet the specified voltage and power demands, and the connection should be correct, otherwise it can't guarantee the printer works normally, even may damage the printer.

2.4 Buttons and Indicators

There are two buttons and two indicators on the printer of SP -POS58. The red light is power indicator, the green one is status indictor, status indicator lights under on-line status, it goes dark under off-line status, it flashes when paper is out.

SP-POS58 has 【LF】 paper feed button and opening upper cover button, print command can enable or disable 【LF】 on or off, under enable status,

hold down 【LF】,start paper feeding, release the button paper feeding stops. Hold down opening upper cover button, open the upper cover in order to change paper.

2.5 Self-test

The self-test can check the condition of printer, if the printer prints out the self-test receipt correctly, it means the printer works normally. Otherwise it needs to repair.

The self-test will print out the firmware version, interface setting and 128 ANK characters.

Holding down 【LF】button and turn on the power, then release the button, self-test begins automatically.

Chapter 3 Print Control Commands

3.1 Summary

SP-POS58 offers ESC/POS print command sets.

Each command is described in following format:

Print Command		Function
Format:	ASCII:	the standard ASCII character sequence
	Decimal:	the decimal numbers sequence
	Hexadecimal:	the hexadecimal number sequence

Explanation: what the command does and how to use it.

Example: some examples are listed to illustrate the command for better understanding.

3.2 Command Specifications

3.2.1 Character control commands

LF		Print and Feed Line
Format:	ASCII:	LF
	Decimal:	10
	Hexadecimal:	0A

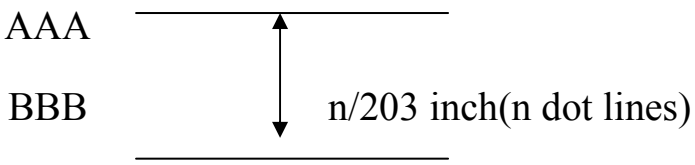
Explanation:

Print the content in the buffer and feed paper one line. Only feed paper forwards one line if the buffer is empty.

ESC J				Print and Feed n Dot Lines
Format:	ASCII:	ESC	J	n
	Decimal:	27	74	n
	Hexadecimal:	1B	4A	n

Explanation:
Print the content in the buffer and feed paper n dot lines.(n/203 inch), n=0~255.
This command is only valid for current line and will not change the space settings that set by ESC 2，ESC 3 commands.

Example:



3.2.2 Line Space Setting Commands

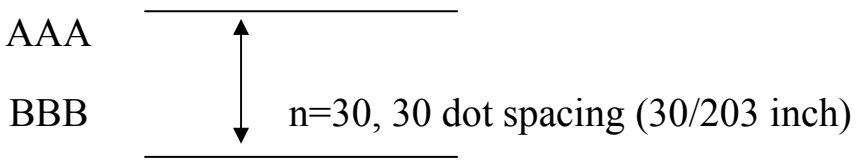
ESC 2			Set Line Spacing to 1/6 Inch
Format:	ASCII:	ESC	2
	Decimal:	27	50
	Hexadecimal:	1B	32

Explanation:
Set line spacing to 1/6 inch.

ESC 3		Set Line Spacing to n Dot Lines (n/203 inch)	
Format:	ASCII：	ESC	3
	Decimal:	27	51
	Hexadecimal:	1B	33

Explanation:
Set line spacing to n dot lines. n=0~255.
One dot line is 1/203 inch for SP-POS58, this command sets the dot-line spacing to n/203 inch. Default n=30.

Example:

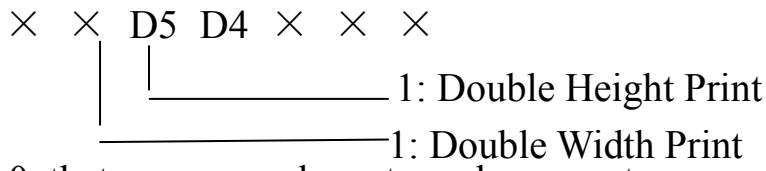


3.2.3 Character Print Commands

ESC !				Set Character Print Mode
Format:	ASCII:	ESC	!	n
	Decimal:	27	33	n
	Hexadecimal:	1B	21	n

Explanation:

ESC ！n is a comprehensive command to set character print mode, is used for selecting print character size. Each bit of print parameter n is defined:



Default n=0, that means no character enlargement.

ESC SO Set Double Width Character Print

Format:	ASCII:	ESC	SO
	Decimal:	27	14
	Hexadecimal:	1B	0E

Explanation:
All characters following this command on the same line are printed in double width, this command can be canceled by a carriage return or DC4 command.

ESC DC4 Cancel Double Width Character Print

Format:	ASCII:	ESC	DC4
	Decimal:	27	20
	Hexadecimal:	1B	14

Explanation:
After carrying out this command, the characters will be printed in normal width.

ESC % Select/Cancel User-defined Characters

Format:	ASCII:	ESC	%	n
	Decimal:	27	37	n
	Hexadecimal:	1B	25	n

Explanation:
When n=1, select user-defined character set; When n=0, select internal character set.
Default n=0

ESC & Define User-defined Characters

Format:	ASCII：	ESC	&	s n m	[a [p]s×a]m-n+1
	Decimal:	27	38	s n m	[a [p]s×a]m-n+1
	Hexadecimal:	1B	26	s n m	[a [p]s×a]m-n+1

Explanation:
ESC & is used to define user-defined characters. s=3，32≤n≤m≤126,

0≤a≤12, 0≤p≤255.

◆ s is the number of bytes in vertical direction, s=3 here.

◆ n is the starting ASCII code of user-defined character.

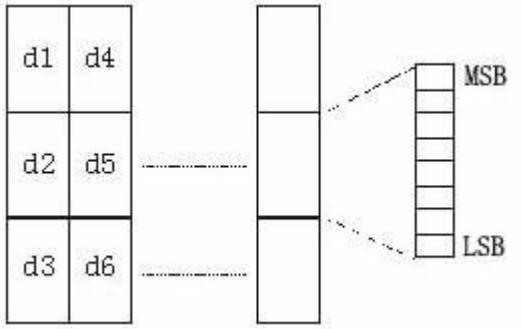
◆ m is the stopping ASCII code of user-defined character.

When define only one character, n=m, the maximum number of user-defined characters is 96.

◆ a is the number of dots in horizontal direction.

◆ p is the data of self-defined characters, there are s×a bytes for each character, the total number of user-defined characters is m-n+1.

◆ User-defined characters are valid until re-defined, reset or power off, format of the user-defined characters is shown as follows:



3.2.4 Special Control Commands

ESC c 5 Enable/Disable Switch Button Function

Format:	ASCII:	ESC	c	5	n
	Decimal:	27	99	53	n
	Hexadecimal:	1B	63	35	n

Explanation:

When n=1, button【LF】is enabled;

When n=0, button【FEED】is disabled;

Default n=0.

3.2.5 Graphics Print Commands

ESC * Set Bit-map Graphics

Format:	ASCII:	ESC	*	m	n1	n2	[d]k
	Decimal:	27	42	m	n1	n2	[d]k
	Hexadecimal:	1B	2A	m	n1	n2	[d]k

Explanation:

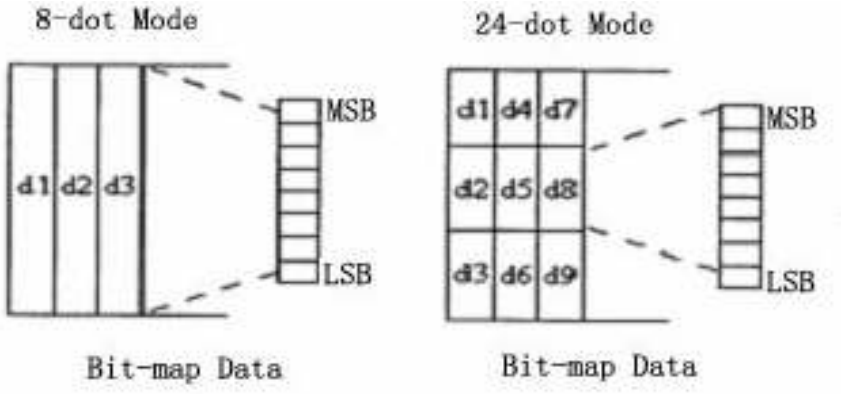
Select bit-map command, m is for setting bit-map mode; n1, n2 are for setting number of dots; [d]k is for setting contents of bit-map.

m=0,1,32,33, n1=0~3. d=0～255.

k=n1+256×n2 (m=0，1)
k=(n1+256×n2)×3 (m=32,33)

- The number of horizontal dots of the graphics is n1+256×n2
- If the number of dots is more than one line, the extra portion will be ignored (referring the following table)
- d is the bit map data, for 1 of bit means the related dot will be printed and for 0 of bit means the related dot will not be printed. (k is the total number of dot)
- m is the selected bit map mode.

M	Mode	Vertical Dot	Horizontal Density	Density	Max. Dots
0	8-dot single density	8	68DPI	101DPI	192
1	8-dot double density	8	68DPI	203DPI	384
32	24-dot single density	24	203DPI	101DPI	192
33	24-dot double density	24	203DPI	203DPI	384



GS / Print Download Bit-map Graphics

Format: ASCII： GS / n
Decimal: 29 47 n
Hexadecimal: 1D 2F n

Explanation:

This command is used to print download bit-map graphics. n=0～3

◆ n is used to select bit-map graphics mode.

◆ To define download bit-map graphics using GS * command:

n	Bit-map mode	Vertical density	Horizontal density
0	Normal	203DPI	203DPI
1	Double width	203DPI	101DPI
2	Double height	101DPI	203DPI
3	Double height and double width	101DPI	101DPI

GS * Define download bit-map graphics

Format:	ASCII：	GS	*	n1	n2	[d]k
	Decimal:	29	42	n1	n2	[d]k
	Hexadecimal:	1D	2A	n1	n2	[d]k

Explanation:

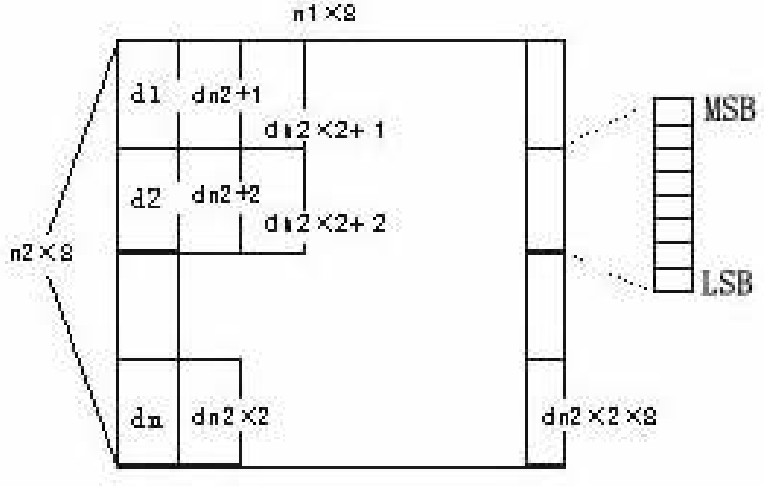
This command is used to define download bit-map graphics.

n1=1～48，n2=1～255，n1×n2<1200, k=n1×n2×8。

◆ d is the bit-map data.

◆ The horizontal size of this graphics is n1×8 dots, and vertical size is n2×8 dots.

◆ The definition is valid until re-define, power off or system reset. Format of the download bit-map data is shown as follows:



3.2.6 Bar Code Print

GS W — Set bar code width

Format:	ASCII：	GS	W	n1	n2
	Decimal:	29	87	n1	n2
	Hexadecimal:	1D	57	n1	n2

Explanation:

n1: bar code narrow bar width, unit: dot. Each dot for SP-POS58 printer is 1/203 inch or 0.125mm.

Default n1=3.

n2: bar code broad bar width

GS k — Print bar code

Format:	ASCII：	GS	k	n	［d］	NUL
	Decimal:	29	107	n	［d］	0
	Hexadecimal:	D	6B	n	［d］	00

Explanation:

n--- Select the printing bar code system:

n	Bar code
2	EAN-13
3	EAN-8

Pay attention to the specified character number of each bar code. EAN-13 and EAN-8 can generate parity characters automatically.

［d］is the printing bar code data.

NUL denotes GS K command is over，and carry out bar code print.

GS H — Select/cancel printing HRI characters

Format:	ASCII：	GS	H	n
	Decimal:	29	72	n
	Hexadecimal:	1D	48	n

Explanation:

n=0，don’t print HRI characters. Default n=0.

n=1，print HRI characters under bar code.

GS h — Set bar code height

Format:	ASCII：	GS	h	n
	Decimal:	29	104	n
	Hexadecimal:	1D	68	n

Explanation:

Set the height of printing bar code.

n=0～255, its unit is dot. When n=0, it is 256 dots.

Each dot for SP-POS58 printer is 1/203 inch or 0.125mm.
Default n=60.

GS w — Set bar code width

Format:	ASCII:	GS	w	n
	Decimal:	29	119	n
	Hexadecimal:	1D	77	n

Explanation:
Set the width of printing bar code.
n＝1～4. When n is different, the width of bar code will be different, as shows in the following tab:

n	Narrow size	Broad size
1	1	3
2	2	5
3	3	7
4	4	9

Its unit is dot. Each dot for SP-POS58 is 1/203 inch or 0.125mm.
Default n=3.

3.2.7 Other Commands

ESC @ — Initialize printer

Format:	ASCII:	ESC	@
	Decimal:	27	64
	Hexadecimal:	1B	40

Explanation:
ESC @ command is to initialize the following contents of the printer:
·Clear the data in the print buffer;
·Restore the default of each print command
·Select character print mode;
·Delete user-defined characters.

ESC p — Cash Drawer control

Format:	ASCII:	ESC	p	m	nl	n2
	Decimal:	27	112	m	nl	n2
	Hexadecimal:	1B	70	m	nl	n2

Explanation:
This command is to generate a pulse to trigger the opening and closing of the cash drawer, n1, n2 define the duration of the trigger pulse.
m=0,0＜nl≤n2≤255。

Opening time is nl× 2ms, closing time is n2× 2ms.

ESC v Transmit Status of Printer

Format: ASCII ： ESC v
Decimal: 27 118
Hexadecimal: 1B 76

Explanation:
Send printer status to the host.
When printer received the command, it transfers one byte through TXD serial interface. Definition of said byte is shown as below:

Bit	Function	Value 0	Value 1
0	Undefined	———	———
1	Undefined	———	———
2	Paper tester	With paper	Without paper
3	Undefined	———	———
4	Not in use	0	0
5	Undefined	———	———
6	Undefined	———	———
7	Undefined	———	———

ESC u Transmit Status of Equipment

Format: ASCII： ESC u n
Decimal: 27 117 n
Hexadecimal: 1B 75 n

Explanation:
Send the peripheral equipment status to the host:
Default n=0
When printer received this command, it transmits one byte through TXD line of the serial interface to the host.

Bit	Function	Value 0	Value 1
0	Cash drawer on/off signal level	Low	High
1	Undefined	———	———
2	Undefined	———	———
3	Undefined	———	———

4	Not in use	0	———
5	Undefined	———	———
6	Undefined	———	———
7	Undefined	———	———

Appendix 1 Performance Index

·Print method: Direct thermal
·Print width: 57.5 ± 0.5mm
·Valid print width: 48mm
·Print density: 8 dots/mm, 384 dots/line
·Print speed: approx.70mm/sec.or 20 lines/sec.
·Reliability:
Print head life: 50km
MCBF: 5 million lines
Using condition:
＊ Print 12 × 24 ASCII characters, print 50 lines each time, intermittent print repeatedly
＊Each dot-line printing at the same time should not exceed 25%, each character line and one dot vertical printing repeatedly should not exceed 11 times
＊Use specified thermal paper

·Thermal paper roll model: TF50KS－E（Japan paper co.ltd）
AF50KS-E(JUJO THERMAL)
· Thermal paper roll
Width－－－ 57.5±0.5mm
Outer Diameter －－－ 80mm（max.）
Inner Diameter－－－ 13mm（min.）
Thickness －－－ 53～60g / m^2

·Print Font
IBM Character set II (ANK):
12×24 dots，1.25（W）×3.00（H）mm;
GB GB2312-80(Chinese):
24×24 dots，3.00（W）×3.00（H）mm.

·Serial interface:

DB25 socket (female), supports RTS/CTS protocol.
Baud rate: 9600bps.
Data structure: 1 start bit + 8 data bits + 1 stop bit. no parity.

·Parallel interface:

DB25 socket (male), 8-bit parallel interface, BUSY/ACK handshaking protocol, TTL signal level.

·Cash drawer control

DC12V，1A，6-pin RJ-11 socket.

·Power Supply

DC12V，3.3A.

·Operation Environment

Operation temperature: 5～40℃
Relative humidity: 10～80％
Operation environment temperature: 5～40℃
Relative humidity: 10～80％
Storage temperature: -20～60℃
Relative humidity: 10～90℃

Appendix 2 Index of Print Commands

Command name	Command	Description
Print commands	LF	Print and feed line
	ESCJ	Print and feed n dot lines
Line spacing setting commands	ESC2	Set character line spacing to 1/6 inch
	ESC3	Set line spacing to n dot lines (n/203 inch)
Character print commands	ESC !	Set character print mode
	ESC SO	Set double width character print
	ESC DC4	Cancel double width character print
	ESC％	Select/Cancel User-defined Characters
	ESC&	Define user-defined characters
Special control commands	ESC c 5	On/Off switch Button function
Graphics print commands	ESC*	Print bit-map graphics
	GS /	Print download bit-map graphics
	GS *	Define download bit-map graphics
Bar code print commands	GS W	Set bar code width
	GS H	Select/cancel printing HRI characters
	GS h	Set bar code height
	GS k	Print bar code
	GS w	Set bar code horizontal size
Other commands	ESC @	Initialize printer
	ESCp	Cash drawer control
	ESCv	Transmit status of printer
	ESC u	Transmit status of equipment

Appendix 3 Index of Print Characters